HEART DISEASE &
STROKE PREVENTION PROGRAM
UTAH DEPARTMENT OF HEALTH

Utah Emergency Medical Service Training Officer Survey, 2007

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This report was funded in part by the Centers for Disease Control and Prevention through the Utah Heart Disease and Stroke Prevention Program, cooperative agreement number U50/CCU821337. The contents of this report are solely the responsibility of the authors and do not represent the opinions of the CDC.

Introduction

Acute stroke is an important medical emergency. Treatment with thrombolytic agents can preserve brain tissue and improve stroke outcomes, but only if administered to the correct type of stroke within 3 hours of symptom onset.[1] Stroke victims must seek treatment and obtain diagnostic tests to be considered for thrombolytic therapy.

Prehospital care is an important link in the Stroke Chain of Survival.[2] Emergency Medical Services (EMS) provides several key steps in the prehospital setting.[3] Possible stroke calls must be dispatched as an emergency so that EMS providers can arrive as soon as possible and help determine the exact time when the potential stroke victim was last seen normal. By using stroke screening protocols, EMS providers can identify possible stroke cases and notify the hospital Emergency Department (ED) about potential stroke cases before the ambulance actually arrives. Prehospital notification enables the hospital ED to alert the stroke team and expedite the necessary lab tests and CT in a timely way so that t-PA can be considered. EMS can transport patients quickly to an appropriate facility with the organizational capability to provide stroke diagnostic and treatment services.

Thus, activation of EMS has been cited as the most important factor in reducing delay in treating potential stroke patients.[4] Because of the importance of prehospital care for stroke patients, the National Association of EMS Physicians issued a position paper calling for training for all EMS providers in the recognition of stroke and early hospital notification.[5] In addition, the position paper highlighted the need to determine the most appropriate destinations for stroke patients and acknowledged the importance of EMS in the continuum of stroke treatment in the community.

This report presents the findings from a survey of EMS training coordinators conducted by the Utah Department of Health (UDOH) in 2007. The questions were designed to guide statewide efforts to improve stroke care in the prehospital setting in Utah by ascertaining information about policies, procedures and training needs related to acute stroke. The survey included questions about how EMS services coordinate stroke care with the hospitals they use.

Methods

In the spring of 2007, the UDOH Heart Disease and Stroke Prevention Program (HDSPP) and the Bureau of Emergency Medical Services (EMS) sent an e-mail to the training officers of 114 training programs in the state with a valid e-mail address. The e-mail invited the training officers to complete a brief electronic survey about the characteristics of their EMS program, along with existing policies and procedures regarding screening, transport and prehospital notification for potential stroke victims. The final portion of the five-part survey asked training coordinators to highlight the areas of their stroke training practices and to identify training needs.

EMS programs were asked to identify themselves as public or private and to list the specific hospitals they used as transport destinations. EMS programs were divided into urban (Salt Lake, Davis, Utah and Weber Counties) and non-urban (all other counties) areas. Hospitals that had received formal designation as a stroke center were also identified, along with those having specific stroke telemedicine links to a comprehensive stroke center. EMS programs that transported to stroke centers were compared to those whose destination hospitals did not include any formally recognized stroke center. Policies and procedures for EMS transport to non-urban hospitals with stroke telemedicine were compared to the policies of those transporting to other non-urban hospitals. All data analysis was done using SAS (version 9.1).

Results

A total of 63 of the 114 training officers completed the online survey, for a response rate of 55% of all EMS programs in the state. They reported using an average of five destination hospitals ranging from 1-18. The vast majority reported receiving public funding as shown in Table 1. Most used priority dispatch systems, and many had implemented the POLARIS system, which is Utah's new prehospital Web-based data collection system. Publicly-funded EMS programs were more likely to be located in rural locations and to include volunteers on staff.

Most dispatch centers regarded stroke as an emergency and most EMS programs throughout the state had written stroke protocols. (Table 2) Of those with stroke protocols, most included patient positioning, oxygen, IV, heart monitor and airway for an unconscious patient. Nearly 90% included a blood glucose check.

The majority used a stroke screen. (Table 2) Only 35.1% of those using a stroke screen always reported the findings

Table 1. Characteristics of Respondent Programs by Urban or Non-urban Locations, 2007

	Overall N=63*	Urban N=27*	Non-Urban N=36*
Funding	79.2%	68.0%	89.3%
% Public Funding	(42 of 53)	(17 of 25)	(25 of 28)
Staff	34.9%	40.7%	30.6%
% EMT & Paramedic Staff	(22 of 63)	(11 of 27)	(11 of 36)
% Any Volunteer Staff	50.8% (32 of 63)	37.0% (10 of 27)	61.1% (22 of 36)
% Hire Part Time Staff	46.0% (29 of 63)	48.1% (13 of 27)	44.4% (16 of 36)
Dispatch	68.3%	80.0%	60.0%
% Use Priority Dispatch	(41 of 60)	(20 of 25)	(21 of 35)
Receiving Hospital	95.2%	96.3%	94.4%
% Use More Than 1 Hospital	(60 of 63)	(26 of 27)	(34 of 36)
% Use Stroke Center	66.7% (42 of 63)	81.5% (22 of 27)	55.6% (20 of 36)

*Not all participants responded to all questions

Table 2. Stroke Prehospital Care in Utah, Overall and in Urban/Non-urban Locations, 2007			
	Overall N=63*	**Urban N=27***	**Non-Urban N=36***
Stroke Dispatched as Emergency	93.3% (56 of 60)	100% (25 of 25)	88.6% (31 of 35)
Stable Stroke Patient Considered Emergency	81.7% (49 of 60)	80.0% (20 of 25)	82.9% (29 of 35)
Written Stroke Protocol	72.9% (43 of 59)	79.2% (19 of 24)	68.6% (24 of 35)
% With Blood Glucose	88.1% (37 of 42)	100% (18 of 18)	79.2% (19 of 24)
Use Stroke Screen/Scale	82.5% (47 of 57)	81.8% (18 of 22)	82.9% (29 of 35)
% Cincinnati Stroke Scale	75.4% (43 of 57)	72.7% (16 of 22)	77.1% (27 of 35)
Prehospital Notification Policy	76.7% (46 of 60)	84.0% (21 of 25)	71.4% (25 of 35)
Transport to Stroke Center	66.7% (42 of 63)	81.5% (22 of 27)	55.6% (20 of 36)
Bypass Another Hospital for Stroke	15.0% (9 of 60)	20.0% (5 of 25)	11.4% (4 of 35)
Stroke Training 1 or More Times Per Year	68.5% (37 of 54)	72.7% (16 of 22)	65.6% (21 of 32)
*Not all participants responded to all questions			

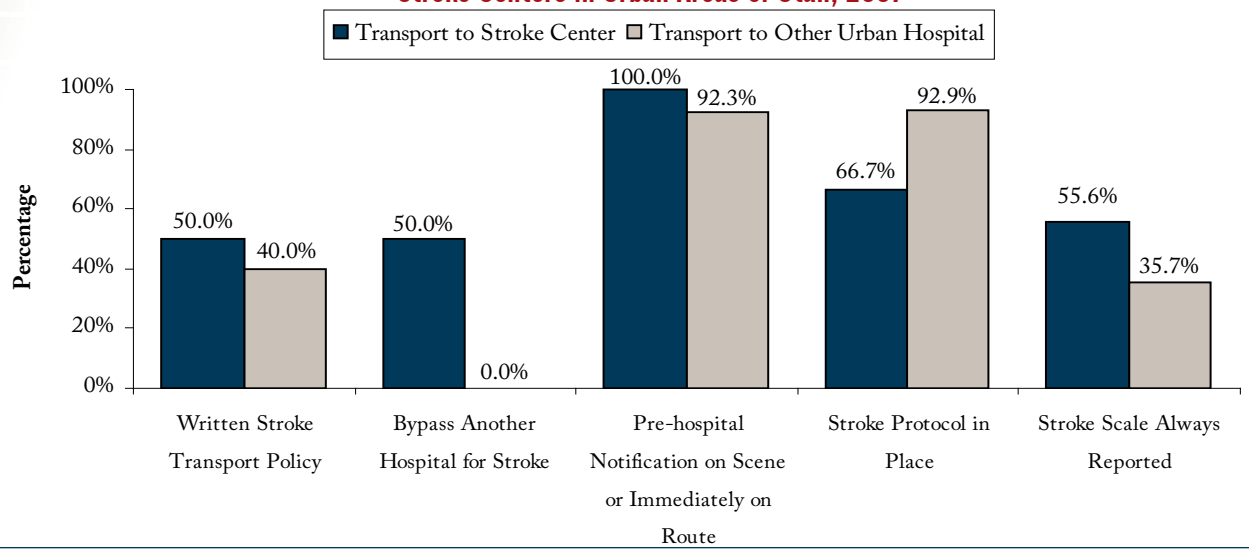
verbally to the destination hospital. Of those surveyed, 87.0% recorded the data, and most included the data on the paper run sheet or POLARIS system. The most commonly used stroke screen was the Cincinnati Stroke Screen or a modification of it. Only two trainers used the LA stroke screen. Of those using the Cincinnati Stroke Screen or a modification, 71.4% had conducted formal training on it.

In the spring of 2007, four Utah hospitals were designated as stroke centers. Of the urban EMS programs surveyed, 40.0% used the stroke centers as primary destination hospitals for stroke patients. Only half of EMS providers that primarily transported stroke patients to designated stroke centers reported having written transport policies. (Figure 1) Few reported bypassing other hospitals when transporting suspected stroke patients. When asked if they would bypass a hospital to go to another with greater stroke capability, 27.8% reported that the average additional difference in driving would exceed 50 miles.

There are six hospitals in non-urban locations with stroke telemedicine capabilities that link them to a stroke center. However, only five of the six hospitals with telemedicine were identified by respondents as the first receiving hospital for their stroke patients. (Table 3) All non-urban EMS programs transporting to hospitals with stroke telemedicine capabilities reported using stroke screens. EMS providers transporting to stroke telemedicine hospitals were more likely to have held stroke training one or more times when compared to providers transporting to non-urban hospitals without stroke telemedicine.

Most EMS programs reported they had held stroke training in the past, but only 68.5% reported holding such training one or more times per year. (Figure 2) When asked what forms of trainings were offered or encouraged by the agency, seminars (85.5%) were more widely used than in-person (29.1%) or online (16.4 %) trainings. Most preferred that stroke training be provided annually or twice a year, and majority of agencies (75.5%) suggested

Figure 1. Characteristics of EMS Providers that Transport to Stroke Centers in Urban Areas of Utah, 2007



that the most effective means of training their personnel was through agency sponsored conferences and seminars. From March 2005 to March 2007, Utah EMS, with support of HDSPP and trainer Brian Pio, conducted detailed prehospital stroke training to approximately 600 EMS instructors at seminars in various locations throughout the state.

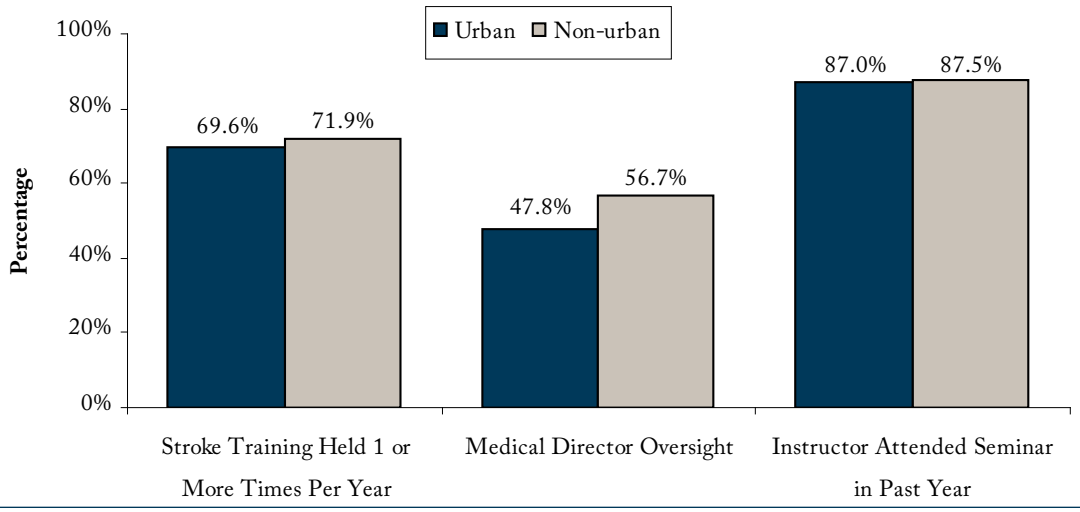
Those surveyed were asked to identify areas for improvement in emergency treatment of stroke. (Figure 2) Of the EMS training officers who responded, most cited the need for increased training opportunities related to emergency treatment of stroke.

Table 3. Characteristics of Prehospital Care in Non-urban Locations With and Without Stroke Telemedicine Capability in the Hospital, 2007

	Transport to Hospital with Stroke Telemedicine N=5	Transport to Hospital with No Telemedicine N=29*
Stroke Dispatched as an Emergency	100% (5 of 5)	92.6% (25 of 27)
Written Stroke Protocol	60.0% (3 of 5)	80.8% (21 of 26)
Stroke Transported as Emergency	100% (5 of 5)	92.0% (23 of 25)
Prehospital Notification Policy	100% (5 of 5)	70.4% (19 of 27)
Stroke Screen/Scale Use	100% (5 of 5)	88.5% (23 of 26)
Stroke Training 1 or More Times Per Year	80.0% (4 of 5)	65.4% (17 of 26)

*Not all participants responded to all questions

Figure 2. Stroke Training and Needs in EMS Programs by Urban/Non-urban Locations, 2007



Conclusions

The survey identified the strengths and weaknesses of prehospital stroke care in Utah. The majority of EMS trainers expressed interest in additional training opportunities for emergency treatment of stroke. Training should focus on creating written stroke protocols and increasing the number of EMS providers that have and utilize prehospital notification policies. Additional training efforts should focus on increasing the knowledge and use of the Cincinnati Stroke Scale.

EMS services provide an essential component to improving care for stroke patients in Utah. The survey results demonstrate progress in coordinating prehospital stroke care in Utah. Due to the unique geographical setting of Utah, it is essential that the distance and time required to transport stroke patients to equipped hospitals are minimized. This report identifies opportunities to improve prehospital stroke care protocols in all areas of Utah.

Acknowledgments

The authors appreciate the EMS personnel who took part in the survey. Without their input this report would not have been possible. We also thank Travis Scoresby and Don Wood, MD, from the Utah EMS program, and Dorothy Ghodes, MD, consultant to HDSPP.

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